

In the Claims:

The current claim set of the application is presented below. Indications as to the status of the claims (“original”, “currently amended”, “canceled”, “new”, etc.) appear in parentheses after the claim number. Deletions are identified in bold with double brackets and strikethrough (e.g. ~~[[deletion]]~~) and new text is identified in bold with underlining (e.g. **new language**).

1. (Currently Amended) An implantable brain stimulation lead comprising:  
a substantially cylindrical lead body having a proximal end, a distal end, and a plurality of substantially ring-like electrodes each approximately defining an arc or circumference;

~~[[and]]~~

an electrically insulating sleeve-like member that extends over at least a portion of the lead body and covers covered portions of the arc or circumference of the electrodes, the insulating member defining a plurality of windows that expose exposed portions of the arc or circumference of the electrodes to increase directionality of stimulation current delivered by the electrodes; **and**

**means for releasably attaching the sleeve-like member to the lead body.**

2. (Currently Amended) The lead of claim ~~[[1]]~~ **89**, wherein each electrode extends approximately 360 degrees about the lead body.

3. (Currently Amended) An implantable brain stimulation lead comprising:  
a lead body having a proximal end, a distal end, and an electrode, wherein the electrode is substantially ring-like and extends approximately 360 degrees about the lead body; ~~[[and]]~~

an electrically insulating sleeve-like member that extends over at least a portion of the lead body and defines a window that exposes a portion of the electrode to increase directionality of stimulation current delivered by the electrode, wherein the portion of the electrode exposed by the window extends between approximately 110 and 130 degrees about the lead body; **and**

**means for releasably attaching the sleeve-like member to the lead body.**

4. (Previously Presented) The lead of claim 3, wherein the portion of the electrode exposed by the window extends approximately 120 degrees about the lead body.

5. (Previously Presented) The lead of claim 1, wherein each of the windows exposes a portion of one of the electrodes.

6. (Currently Amended) The lead of claim ~~[[5]]~~ **89**, wherein the lead body includes four electrodes, and the insulating member defines four windows.

7. (Original) The lead of claim 5, wherein at least some of the windows are defined at different axial positions along the lead body.

8. (Previously Presented) The lead of claim 5, wherein at least some of the windows are defined at different circumferential positions about the lead body.

9. (Currently Amended) An implantable brain stimulation lead comprising:  
a lead body having a proximal end, a distal end, and an electrode; and  
an electrically insulating sleeve-like member that extends over at least a portion of the lead body and defines a window that exposes a portion of the electrode to increase directionality of stimulation current delivered by the electrode; **and**

**means for releasably attaching the sleeve-like member to the lead body;**

wherein the lead body has a plurality of electrodes, and the window is pitched to extend in a spiral pattern along the length and about the circumference of the insulating member and thereby expose portions of each of the electrodes.

10. (Currently Amended) The lead of claim ~~[[1]]~~ **90**, wherein the ~~[[insulating]]~~ sleeve-like member has a generally tubular configuration defining a lumen for receiving the lead body.

11. (Previously Presented) The lead of claim 10, wherein the sleeve-like member is molded to define the plurality of windows.

12. (Previously Presented) The lead of claim 10, wherein the sleeve-like member is cut to define the plurality of windows.

13. (Canceled)

14. (Previously Presented) The lead of claim 1, wherein each window has a shape selected from the group consisting of a rectangle, square, oval and circle.

15. (Canceled)

16. (Canceled)

17. (Currently Amended) An implantable brain stimulation lead comprising:  
a lead body having a proximal end, a distal end, and at least one substantially ring-like electrode approximately defining an arc or circumference; ~~[[and]]~~

sleeve-like means for insulating at least a portion of the lead body, including at least a covered portion of the arc or circumference of the electrode, the sleeve-like means defining a plurality of windows for exposing exposed portions of the arc or circumference of the electrode to increase directionality of stimulation current delivered by the electrode; and

means for releasably attaching the sleeve-like means to the lead body.

18. (Currently Amended) ~~[[An]]~~ The implantable brain stimulation lead of claim 17  
~~[[comprising:~~

~~a lead body having a proximal end, a distal end, and an electrode; and~~  
~~sleeve-like means for insulating at least a portion of the lead body, the sleeve-like~~  
~~means including window means for exposing a portion of the electrode to increase~~  
~~directionality of stimulation current delivered by the electrode;]]~~

wherein the electrode is substantially ring-like and extends approximately 360 degrees about the lead body, and the portion of the electrode exposed by the window means extends for approximately 110 to 130 degrees about the lead body.

19. (Previously Presented) The lead of claim 18, wherein the portion of the electrode exposed by the window means extends approximately 120 degrees about the lead body.

20. (Previously Presented) The lead of claim 17, wherein the lead body has a plurality of electrodes, and the insulating means insulates a first portion of each of the electrodes and windows expose a second portion of each of the electrodes.

21. (Previously Presented) The lead of claim 20, wherein the windows expose first portions of the electrodes at different axial positions along the lead body.

22. (Previously Presented) The lead of claim 20, wherein the windows expose second portions of the electrodes at different circumferential positions about the lead body.

23. (Currently Amended) An implantable brain stimulation lead comprising:  
a lead body having a proximal end, a distal end, and an electrode; **[[and]]**  
sleeve-like means for insulating at least a portion of the lead body, the sleeve-like means including window means for exposing a portion of the electrode to increase directionality of stimulation current delivered by the electrode; **and**

**means for releasably attaching the sleeve-like means to the lead body;**

wherein the lead body has a plurality of electrodes, and the insulating means defines a window that is pitched to extend in a spiral pattern along the length and about the circumference of the insulating member and thereby expose portions of each of the electrodes.

24. (Canceled)

25. (Canceled)

26. (Currently Amended) An implantable lead kit for brain stimulation, the lead kit comprising:

a lead body having a proximal end, a distal end, and at least one substantially ring-like electrode approximately defining an arc or circumference; and

an electrically insulating sleeve-like member defining **[[a]]** a plurality of windows; and  
means for **releasably** attaching the insulating sleeve-like member to the lead body such that the insulating sleeve-like member extends over at least a portion of the lead body to cover a covered portion of the arc or circumference of the at least one electrode and the windows expose exposed portions of the arc or circumference of the at least one electrode to thereby increase directionality of stimulating current delivered by the at least one electrode.

27. (Previously Presented) The lead kit of claim 26, wherein the electrode extends approximately 360 degrees about the lead body.

28. (Currently Amended) An implantable lead kit for brain stimulation, the lead kit comprising:

a lead body having a proximal end, a distal end, and an electrode wherein the electrode is substantially ring-like and extends approximately 360 degrees about the lead body; and

an electrically insulating sleeve-like member defining a window wherein the portion of the electrode exposed by the window extends between approximately 110 and 130 degrees about the lead body; and

means for **releasably** attaching the insulating sleeve-like member to the lead body such that the insulating sleeve-like member extends over at least a portion of the lead body and the window exposes a portion of the electrode to thereby increase directionality of stimulating current delivered by the electrode.

29. (Previously Presented) The lead kit of claim 28, wherein the portion of the electrode exposed by the window extends approximately 120 degrees about the lead body.

30. (Previously Presented) The lead kit of claim 26, wherein the lead body has a plurality of electrodes, each of the windows exposing a portion of one of the electrodes.

31. (Original) The lead kit of claim 30, wherein the lead body includes four electrodes, and the insulating member defines four windows.

32. (Original) The lead kit of claim 30, wherein at least some of the windows are defined at different axial positions along the lead body.

33. (Original) The lead kit of claim 30, wherein the lead body is substantially cylindrical, and at least some of the windows are defined at different circumferential positions about the lead body.

34. (Currently Amended) An implantable lead kit for brain stimulation, the lead kit comprising:

a lead body having a proximal end, a distal end, and a plurality of electrodes; and  
an electrically insulating sleeve-like member defining a window wherein the window is pitched to extend in a spiral pattern along the length and about the circumference of the insulating sleeve-like member and thereby exposes portions of each of the electrodes; and  
means for releasably attaching the insulating sleeve-like member to the lead body such that the insulating sleeve-like member extends over at least a portion of the lead body and the window exposes portions of each of the electrodes to thereby increase directionality of stimulating current delivered by the electrode.

35. (Currently Amended) An implantable lead kit for brain stimulation, the lead kit comprising:

a lead body having a proximal end, a distal end, and a plurality of electrodes; ~~[[and]]~~  
a plurality of the insulating sleeve-like members, wherein the insulating sleeve-like members define differently configured windows each configured to selectively expose a portion of at least one of the plurality of electrodes; and

means for **releasably** attaching the insulating sleeve-like members to the lead body such that the insulating sleeve-like members extends over at least a portion of the lead body and the windows expose portions of the electrodes to thereby increase directionality of stimulating current delivered by the electrodes.

36. (Currently Amended) A implantable lead kit for brain stimulation, the lead kit comprising:

a lead body having a proximal end, a distal end, and an electrode wherein the lead body has a diameter of approximately 1.1 to 1.5 mm and the electrode has a length extending longitudinally relative to the lead body of approximately 1.3 to 1.7 mm; **[[and]]**

an electrically insulating sleeve-like member defining a window; and

means for **releasably** attaching the insulating sleeve-like member to the lead body such that the insulating sleeve-like member extends over at least a portion of the lead body and the window exposes a portion of the electrode to thereby increase directionality of stimulating current delivered by the electrode.

37. (Previously Presented) The lead of claim 36, wherein the lead body has a diameter of approximately 1.3 mm and the electrode has a length extending longitudinally relative to the lead body of approximately 1.5 mm.

38. (Currently Amended) A method for producing directional output from an implantable stimulation lead having a lead body and at least one substantially ring-like electrode formed with the lead body, the at least one electrode approximately defining an arc or circumference, the method comprising:

forming an insulating sleeve-like member, wherein the insulating sleeve-like member defines a plurality of windows; **[[and]]**

positioning the insulating sleeve-like member relative to the lead body so that the windows expose selected portions of the arc or circumference of the at least one electrode, while insulating at least one other portion of the arc or circumference of the at least one electrode, to increase directionality of stimulating current delivered by the at least one electrode; **and**

**releasably attaching the insulating sleeve-like member to the lead body such that the insulating sleeve-like member extends over at least a portion of the lead body to cover a covered portion of the arc or circumference of the at least one electrode and the windows expose exposed portions of the arc or circumference of the at least one electrode to thereby increase directionality of stimulating current delivered by the at least one electrode.**

39. (Currently Amended) A method for producing directional output from an implantable stimulation lead having a lead body and an electrode formed with the lead body, the method comprising:

forming an insulating sleeve-like member, wherein the insulating sleeve-like member defines a window; **[[and]]**

positioning the insulating sleeve-like member relative to the lead body so that the window exposes a selected portion of the electrode to increase directionality of stimulating current delivered by the stimulation electrode; **and**

**releasably attaching the insulating sleeve-like member to the lead body such that the insulating sleeve-like member extends over at least a portion of the lead body to cover a covered portion of the electrode and the window exposes an exposed portion of the electrode to thereby increase directionality of stimulating current delivered by the electrode;**

wherein the electrode is substantially ring-like and extends approximately 360 degrees about the lead body, and the portion of the electrode exposed by the window extends for approximately 110 to 130 degrees about the lead body.

40. (Original) The method of claim 39, wherein the portion of the electrode exposed by the window extends approximately 120 degrees about the lead body.

41. (Previously Presented) The method of claim 38, wherein the lead body has a plurality of electrodes, and the insulating sleeve-like member defines a plurality of windows, the method further comprising positioning the insulating sleeve-like member so that each of the windows exposes a portion of one of the electrodes.



42. (Previously Presented) The method of claim 41, wherein the lead body includes four electrodes, and the insulating sleeve-like member defines four windows, the method further comprising positioning the insulating sleeve-like member so that each of the four windows exposes a portion of one of the four electrodes.

43. (Original) The method of claim 41, wherein at least some of the windows are defined at different axial positions along the lead body.

44. (Original) The method of claim 41, wherein the lead body is substantially cylindrical, and at least some of the windows are defined at different circumferential positions about the lead body.

45. (Currently Amended) A method for producing directional output from an implantable stimulation lead having a substantially cylindrical lead body and an electrode formed with the lead body, the method comprising:

forming an insulating sleeve-like member, wherein the insulating sleeve-like member defines a window; **[[and]]**

positioning the insulating sleeve-like member relative to the lead body so that the window exposes a selected portion of the electrode to increase directionality of stimulating current delivered by the stimulation electrode; **and**

**releasably attaching the insulating sleeve-like member to the lead body such that the insulating sleeve-like member extends over at least a portion of the lead body to cover a covered portion of the electrode and the window exposes an exposed portion of the electrode to thereby increase directionality of stimulating current delivered by the electrode;**

wherein the lead body has a plurality of electrodes, and the window is pitched to extend in a spiral pattern along the length and about the circumference of the insulating member and thereby expose portions of each of the electrodes, the method further comprising positioning the

insulating sleeve-like member so that selected portions of the electrodes are exposed at selected portions of the window.

46. (Previously Presented) The method of claim 38, wherein positioning the insulating sleeve-like member includes sliding the insulating sleeve-like member relative to the lead body.

47. (Currently Amended) A method for producing directional output from an implantable stimulation lead having a lead body and an electrode formed with the lead body, the method comprising:

forming an insulating member, wherein the insulating member is molded to define a window and the insulating member is formed as a sleeve-like member that is adapted to extend over a portion of the lead body; **[[and]]**

positioning the insulating member relative to the lead body so that the window exposes a selected portion of the electrode to increase directionality of stimulating current delivered by the stimulation electrode, wherein positioning the insulating member includes sliding the insulating member relative to the lead body; **and**

**releasably attaching the insulating member to the lead body such that the insulating member extends over at least a portion of the lead body to cover a covered portion of the electrode and the window exposes an exposed portion of the electrode to thereby increase directionality of stimulating current delivered by the electrode.**

48. (Currently Amended) A method for producing directional output from an implantable stimulation lead having a lead body and an electrode formed with the lead body, the method comprising:

forming an insulating member over the lead body, wherein the insulating member is cut to define a window and the insulating member is formed as a sleeve-like member that is adapted to extend over a portion of the lead body; **[[and]]**

positioning the insulating member relative to the lead body so that the window exposes a selected portion of the electrode to increase directionality of stimulating current delivered by the

stimulation electrode, wherein positioning the insulating member includes sliding the insulating member relative to the lead body; **and**

**releasably attaching the insulating member to the lead body such that the insulating member extends over at least a portion of the lead body to cover a covered portion of the electrode and the window exposes an exposed portion of the electrode to thereby increase directionality of stimulating current delivered by the electrode.**

49. (Canceled)

50. (Original)           The method of claim 38, wherein the window has a shape selected from the group consisting of a rectangle, square, oval and circle.

51. (Canceled)

52. (Canceled)

53. (Original)           The method of claim 31, further comprising defining axial and radial positions of the lead body relative to a desired stimulation target.

54. (Currently Amended)   An implantable brain stimulation lead comprising:  
a lead body having a proximal end, a distal end, and a substantially ring-like electrode approximately defining an arc or circumference;

an electrically insulating sleeve-like member that extends over at least a portion of the lead body, thereby covering a first portion of the arc or circumference of the electrode, and defines a window that exposes a second portion of the electrode to increase directionality of stimulation current delivered by the electrode; and

a **releasable** mechanism that substantially fixes the insulating member in place relative to the lead body.

55. (Original) The lead of claim 54, wherein the mechanism includes an interlocking structure that joins the insulating member and the lead body.

56. (Original) The lead of claim 55, wherein the interlocking structure includes an aperture formed in the insulating member and a locking member carried by the lead body, the locking member being insertable into the aperture to substantially fix the insulating member in place relative to the lead body.

57. (Currently Amended) An implantable brain stimulation lead comprising:  
a lead body having a proximal end and a distal end;  
a distal electrode adjacent the distal end of the lead body, the distal electrode being substantially ring-like and approximately defining an arc or circumference;  
an intermediate electrode disposed between the proximal and distal ends of the lead body, the intermediate electrode being substantially ring-like and approximately defining an arc or circumference;  
a first electrically insulating sleeve-like member that extends over a portion of the lead body proximate the distal end, thereby covering a first portion of the circumference of the distal electrode, and defines a first window that exposes a second portion of the distal electrode to increase directionality of stimulation current delivered by the distal electrode; **[[and]]**  
a second electrically insulating sleeve-like member that extends over a portion of the lead body between the proximal end and the distal end, thereby covering a first portion of the circumference of the intermediate electrode, and defines a second window that exposes a second portion of the intermediate electrode to increase directionality of stimulation current delivered by the intermediate electrode; **and**  
**means for releasably attaching at least one of the first and second insulating sleeve-like members to the lead body.**

58. (Original) The lead of claim 57, wherein the intermediate electrode is positioned for access to a first brain target and the distal electrode is positioned for access to a brain second target.

59. (Original) The lead of claim 57, wherein the distal electrode includes a plurality of distal electrodes.

60. (Currently Amended) A brain stimulation system comprising:  
a lead body having a proximal end and a distal end;  
at least one substantially ring-like electrode on the lead body, the electrode approximately defining an arc or circumference;  
an electrically insulating sleeve-like member that extends over at least a portion of the lead body, thereby covering a first portion of the arc or circumference of the at least one electrode, and defines a plurality of windows that expose second portions of the at least one electrode to increase directionality of stimulation current delivered by the electrode; **and means for releasably attaching the sleeve-like member to the lead body;**  
a conductor extending between the electrode and the proximal end of the lead body; and  
a stimulation controller that delivers stimulation current to the electrode via the conductor.

61. (Original) The system of claim 60, wherein the electrode is substantially ring-like and extends approximately 360 degrees about the lead body.

62. (Currently Amended) A brain stimulation system comprising:  
a lead body having a proximal end and a distal end;  
an electrode on the lead body wherein the electrode is substantially ring-like and extends approximately 360 degrees about the lead body;  
an electrically insulating sleeve-like member that extends over at least a portion of the lead body and defines a window that exposes a portion of the electrode to increase directionality of stimulation current delivered by the electrode wherein the portion of the electrode exposed by the window extends between approximately 110 and 130 degrees about the lead body; **and means for releasably attaching the sleeve-like member to the lead body;**  
a conductor extending between the electrode and the proximal end of the lead body; and

a stimulation controller that delivers stimulation current to the electrode via the conductor.

63. (Original)            The system of claim 62, wherein the portion of the electrode exposed by the window extends approximately 120 degrees about the lead body.

64. (Original)            The system of claim 61, wherein the lead body has a plurality of electrodes, and the insulating member defines a plurality of windows, each of the windows exposing a portion of one of the electrodes.

65. (Original)            The system of claim 64, wherein at least some of the windows are defined at different axial positions along the lead body.

66. (Original)            The system of claim 64, wherein the lead body is substantially cylindrical, and at least some of the windows are defined at different circumferential positions about the lead body.

67. (Currently Amended)    A brain stimulation system comprising:  
a lead body having a proximal end and a distal end;  
a plurality of electrodes on the lead body;  
an electrically insulating sleeve-like member that extends over at least a portion of the lead body and defines a window that exposes a portion of each of the electrodes to increase directionality of stimulation current delivered by the electrodes wherein the window is pitched to extend in a spiral pattern along the length and about the circumference of the insulating member and thereby expose portions of each of the electrodes; **and**  
**means for releasably attaching the sleeve-like member to the lead body;**  
a conductor extending between the electrode and the proximal end of the lead body; and  
a stimulation controller that delivers stimulation current to the electrode via the conductor.

68. (Previously Presented)                      The system of claim 60, wherein the insulating sleeve-like member is molded to define the window.

69. (Previously Presented)                      The system of claim 60, wherein the insulating sleeve-like member is cut to define the window.

70. (Canceled)

71. (Canceled)

72. (Currently Amended)    An implantable brain stimulation lead comprising:  
a lead body having a proximal end, a distal end, and at least one substantially ring-like electrode approximately defining an arc or circumference; **[[and]]**  
an electrically insulating sleeve-like member that extends over at least a portion of the lead body, thereby covering at least a first portion of the arc or circumference of the at least one electrode, and defines a plurality of windows that expose second portions of the at least one electrode to increase directionality of electrical activity sensed by the electrode **and**  
**means for releasably attaching the sleeve-like member to the lead body.**

73. (Currently Amended)    An implantable brain stimulation lead comprising:  
a substantially cylindrical lead body having a proximal end, a distal end, and at least one substantially ring-like electrode having an arc or circumference extending substantially around the lead body; **[[and]]**  
an electrically insulating sleeve-like member extending over at least a portion of the lead body to cover at least a first portion of the circumference of the electrode, and defining a plurality of windows that expose second portions of the circumference of the at least one electrode, thereby increasing directionality of stimulation current delivered by the electrode; **and**  
**means for releasably attaching the sleeve-like means to the lead body.**

74. (Previously Presented) The implantable brain stimulation lead of claim 73 wherein the second portion of the arc or circumference of the electrode extends between approximately 110 and 130 degrees about the lead body.

75. (Previously Presented) The implantable brain stimulation lead of claim 74, wherein the portion of the electrode exposed by the window extends approximately 120 degrees about the lead body.

76. (Previously Presented) The implantable brain stimulation lead of claim 73, wherein:  
the lead body has a plurality of substantially ring-like electrode each having an arc or circumference extending substantially around the lead body; and  
the insulating sleeve-like member covers first portions of the arc or circumference of the electrodes and defines a plurality of windows exposing second portions of the arc or circumference of the electrodes.

77. (Previously Presented) The lead of claim 76, wherein the lead body includes four electrodes, and the insulating sleeve-like member defines four windows.

78. (Previously Presented) The lead of claim 76, wherein at least some of the windows are defined at different circumferential positions about the lead body.

79. (Previously Presented). The lead of claim 73, wherein:  
the lead body has a plurality of substantially ring-like electrodes each having an arc or circumference extending substantially around the lead body, with a first portion of the arc or circumference of each electrode being covered by the insulating member; and  
the window is pitched to extend in a spiral pattern along the length and about the circumference of the insulating sleeve-like member and thereby expose a second



portion of the circumference of each of the electrodes in a spiral pattern along the lead body.

80. (Previously Presented) The lead of claim 73, wherein:  
the lead body has a plurality of substantially ring-like electrodes each having an arc or circumference extending substantially around the lead body, with a first portion of the arc or circumference of each electrode being covered by the insulating member; and  
the window exposes a portion of the arc or circumference of each of the electrodes.

81. (Currently Amended) The lead of claim ~~[[73]]~~ 87, wherein the insulating sleeve-like member has a generally tubular configuration defining a lumen for receiving the lead body.

82. (Previously Presented) The lead of claim 81, wherein the sleeve-like member is molded to define the window.

83. (Previously Presented) The lead of claim 81, wherein the sleeve-like member is cut to define the window.

84. (Canceled).

85. (Previously Presented) The lead of clam 73, wherein the window has a shape selected from the group consisting of a rectangle, square, oval and circle.

86. (Currently Amended) The lead of clam ~~[[85]]~~ 89, wherein the window has a shape selected from the group consisting of a rectangle and a square.

87. (Currently Amended) The lead of clam ~~[[85]]~~ 90, wherein the window has a shape selected from the group consisting of an oval and a circle.

88. (Currently Amended) The lead of claim ~~[[73]]~~ **89**, wherein the lead body has a diameter of approximately 1.1 to 1.5 mm and the electrode has a length, extending longitudinally relative to the lead body, of approximately 1.3 to 1.7 mm.

89. (Currently Amended) An implantable brain stimulation lead comprising:  
a substantially cylindrical lead body having a proximal end, a distal end, and a plurality of substantially ring-like electrodes each having an arc or circumference extending substantially around the lead body; and  
an electrically insulating member extending over at least a portion of the lead body to cover at least covered portions of the circumference of the electrodes, and defining a plurality of windows that expose exposed portions of the circumference of the electrode, thereby increasing directionality of stimulation current delivered by the electrode  
wherein at least two windows are defined at different **axial and** circumferential positions about the lead body.

90. (Previously Presented) The lead of claim 89, wherein the insulating member is formed as a sleeve-like member that extends over a portion of the lead body.

91. (Previously Presented) The lead of claim 89, wherein the insulating member is coated onto the lead body to define the window.